



US005519759A

United States Patent [19][11] **Patent Number:** **5,519,759****Heineck et al.**[45] **Date of Patent:** **May 21, 1996**

[54] **METHOD FOR THE SYNCHRONIZATION OF BASE STATIONS IN A MULTICELLULAR, WIRELESS TELEPHONE SYSTEM**

[75] Inventors: **Frank Heineck**, Munich; **Karl Klug**, Miesbach, both of Germany

[73] Assignee: **Siemens Aktiengesellschaft**, Munich, Germany

[21] Appl. No.: **250,482**

[22] Filed: **May 27, 1994**

[30] **Foreign Application Priority Data**

May 28, 1993 [DE] Germany 43 17 895.2

[51] **Int. Cl.⁶** **H04Q 7/36**

[52] **U.S. Cl.** **379/59; 455/33.1; 455/51.1**

[58] **Field of Search** **379/59; 455/33.1, 455/51.1; 375/356**

[56] **References Cited**

U.S. PATENT DOCUMENTS

5,404,575 4/1995 Lehto 455/51.1

FOREIGN PATENT DOCUMENTS

0226610 1/1987 European Pat. Off. .
0437835 7/1991 European Pat. Off. .
3011935 10/1981 Germany .

OTHER PUBLICATIONS

Telcom Report 8 (1985) Heft 5, Bernhard Hildebrandt, "Die Basisstation im Zellularen Funkfernsprechnet C450", pp. 337-343.

Telcom Report 9 (1986), Wolfgang Riedel, "Netzsynchro-nitaet im Mobilfunksystem C450", pp. 286-288.

IEEE Communications, Jan. 1991, "A Business Cordless PABX Telephone System on 800 MHz Based on the DECT Technology", Colin Buckingham et al, pp. 105-110.

Ascom Technische Mitteilungen, Mar./Apr. 1991, "Die schnurlose Teilnehmervermittlungs-anlage CTS 800"-von der Idee zum Produkt., pp. 14-24.

Ericsson Review, No. 8, 1987, "Ericsson Cellular Mobile Telephone Systems", Goran Soderholm et al., pp. 42-49.

Funkschau 21/1990, Mobile Kommunikation "Schnurlose Burosysteme fur die neunziger Jahre", Von Geraldine Wilson, pp. 52-54.

Philips Telecommunication Review, vol. 49, No. 3, Sep. 1991, "DECT, A Universal Cordless Access System", R. J. Mulder, pp. 68-73.

Funkschau Nov. 1991, Funktechnik, "Die Basisstation im GSM-Mobilfunknetz", Von Rudi Markschlager, pp. 58-62.

Primary Examiner—Dwayne D. Bost

Attorney, Agent, or Firm—Hill, Steadman & Simpson

[57] **ABSTRACT**

The base stations (BS) in a multicellular, wireless telephone system are connected via trunk lines (VL) to a communication system (KS), particularly to a telephone private branch exchange. The base stations (BS) are arranged at such a distance from one another that synchronization information (si) wirelessly transmitted from one base station (BS) can be at least partially received in a neighboring base station (BS). Both the initial, wireless synchronization as well as the synchronization during operation are controlled by the communication system such that respectively one base station (BS) is synchronized to the synchronization information (si) transmitted from a neighboring base station (BS). Compared to a synchronization of the base stations (BS) via trunk lines (VL), these deviations due to running times and different processing speeds in the synchronization unit realized in circuit-oriented terms are avoided in the wireless synchronization. Furthermore, synchronization of base stations (BS) across communication systems is possible.

15 Claims, 2 Drawing Sheets

